GARDEN AND FOREST.

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School Gardens and School Grounds.

A FORTNIGHT ago we spoke of a leaflet sent out from the Cornell Experiment Station, which invited each of the school children of the state of New York to plant a little garden of Sweet Peas and China Asters. The circular contained brief instructions about selecting and preparing the ground, planting the seed and caring for the plants, and promised more complete directions to any who should make request for them. All this was done under a law of this state whose purpose is to broaden out the field of the experiment station and give it something of the character of the university extension work which is carried on now in various directions. A correspondent writes to inquire why the obvious plan of having a garden attached to every school has not been suggested instead of encouraging each child to have a garden of its own. In carrying out the plan of "nature study" in the schools it is argued that a school garden would always be ready to furnish material for investigation in botany and horticulture; it could be made of immediate practical benefit in setting forth some of the elementary principles of plant biology, and it would enable young people to see the reasons for many of the processes of horticulture and agriculture. No one would expect that a school garden would make expert cultivators, but with the aid of such an experimental plot many principles might be learned which lie at the foundation of the sciences upon which horticulture and agriculture rest. To show that is not an impracticable suggestion our correspondent points to the example of Europe where there are school gardens by the thousand, where many of the country schools have botanical museums, entomological collections and cabinets of minerals, and some of them beehives, for purposes of investigation. American children are as apt to learn as any in the world, and yet few of them can give the names of the trees and shrubs they find along the road to school, and fewer still know anything about our common insects and their habits, or the birds which are filling the air with melody these spring mornings.

All this is perfectly true, but before our children can be taught effectively in this direction we must first teach the teacher. Two or three months ago in an article on agricultural education we cited the instance of a primary school in Belgium which was visited by a representative of the Association of American Colleges and Experiment Stations. When this visit was made, a class of boys and girls about twelve years old were listening to some instructions which were carried on with the help of simple chemical experiments and skillful questions within their comprehension, so as to stimulate their observation and broaden their knowledge. The particular subject of this lesson was milk, and it was reported that as the different members of the class summed up what they had listened to and seen and thought, it was evident that from this time forth their knowledge of milk, its composition and uses, was considerably wider than it would have been if they had never received the lesson. Around the walls of this schoolroom hung pictures of plants and agricultural implements, and adjoining the school was a small garden in which many kinds of plants were growing and in which different methods of cultivation were tried for the instruction of the pupils. The report went on to explain that this teacher was the secretary of the local horticultural society, and in this capacity he was helping in their business the fathers of the children whom he was instructing. No doubt, these children will be more inclined to avail themselves of the most approved methods of scientific agriculture than they would be without this special training, but this is not all. Their minds will be more thoroughly trained for practical use, and they will be stronger and more logical thinkers than they would have been without this instruction. If, therefore, these leaflets sent out by the Cornell Experiment Station lay the foundation for any systematic preparation of common-school teachers for giving practical lessons in the proper method of studying natural objects, they inaugurate one of the most promising ventures that have recently been undertaken in the field of education.

We should not counsel any teacher to wait before establishing a plant garden until he is as thorough a gardener as the Belgium teacher to whom we have alluded. Any one who is apt to teach and who has enough experience to grow common plants with average success can use a garden in connection with this nature study to good advantage. A mere book-man will fail, but a teacher who is competent to lead and direct his pupils in their personal investigations of the mysteries of nature could find abundant material for helpful illustration in a school garden. We have heard it objected that American schoolboys, out of mere wantonness, would destroy any planting of this kind; and it has been offered as a reason why school-grounds are not more generally beautified with trees and shrubs that the pupils would mutilate them. But, on the contrary, there is the strongest evidence to prove that wherever flowers and shrubs are planted on school-grounds, and the children are invited to aid in their cultivation, they soon acquire an affectionate interest in them, and not only refrain from injuring them, but take pride in protecting and developing them. Boys and girls need playgrounds even more than they need gardens, and the first adjunct to a school building ought to be some place where they can play games—a plot that will answer for an outdoor gymnasium. Few school-yards in the country, however, are so contracted that there is no room for vines or herbaceous plants along the walls of the schoolhouse, and in many places it is possible to have a real garden in which the children can take an active interest and feel a responsibility—a garden where they can learn lessons in order as well as in natural science, and acquire a habit of observing closely the beauties of structure and of adaptation in the different forms of vegetable life.

This is apart from the ordering of school-grounds with a primary view to their neatness and beauty. A large proportion of the children of the country spend many hours of the day for five days in the week in the schoolhouse or near it, and certainly if they live upon an unclean floor, with stained and battered ceilings and decrepit

furniture, the lesson they receive in taste and morals will not be the same as it would be if they were in a neat and tidy room with simple and cheerful decorations. If the grounds about the schoolhouse are bare and comfortless they would hardly suggest any refinement or elevation in the instruction within, and certainly grassy, shrub-bordered grounds with well-kept trees will have a more civilized look, and if the minds of the young are influenced by external objects, cleanly and beautiful surroundings ought to suggest orderly habits of life and thought. At all events, there is no reason why, in even the poorest neighborhoods, the grounds about schoolhouses should not be beautified by the shrubs and plants which can be obtained from the nearest wood. Where there is a will there is a way, and a dilapidated schoolhouse with an unshaded and repulsive yard means that the community lacks civilization, that it does not possess even the germs of refinement. School gardens, too, are possible wherever there are a cultivated and enterprising teacher and an intelligent community, and the time ought to be near at hand when a garden and window plants will be considered quite as essential articles of school equipment as maps and apparatus for experiments in the sciences.

Dr. Augustine Henry, of the Chinese Custom Service, in a personal letter from Mengtse, writes the conductor of this journal:

There is here a fair number of northerly forms, as Fagus, Corylus (one species each); of Quercus, perhaps twelve species. Coniferæ are few, two Pinus, an Abies and Cryptomeria Japonica. The flora seems very varied, with many genera. Clematis has, perhaps, fifteen to twenty species; Lespedeza, Desmodium, Uraria, many species. Characteristic Hupeh plants still occur—Platycarya strobilacea, Buddleia, several species; but only one Acer. I have just found an Altingia. But I cannot pretend to go into an account of the flora yet. I must have close on a thousand species in the six months' collecting. I wish I had nothing else to do but botanize, then I might hope to rival Delavay's three thousand species from western Yun-nan.

I have not been to any tremendous forest yet, though I was in one which must have been fifteen miles long. My native has just come back from a forest situated between here and Laohey, which he describes as full of immense trees and lots of big game—bear, wild pig, red deer, musk deer and panthers.

It is very curious to note how persistent the Chinese have been in deforesting their country. On the Red River in Tongking we saw much forest, but the moment we entered the Yun-nan part of the river, only grass hills and little shrubberies. Last month in Tongking, close to the Red River, a herd of wild elephants was discovered in the forest, and two were shot by the French officers. And I imagine elephants must have big forests to live in. So the best collecting ground is on the Yun-nan-Tongking frontier. I hope to set off soon on a trip of twenty days or so.

Second-growth White Pine in Pennsylvania.

Forest Conditions.—The valley along the Bear Creek, Pennsylvania, attracts attention by its marked tendency to reproduce the White Pine. The region is practically stripped of its forests and presents a familiar picture of desolation. Small and comparatively young groves are seen now and then scattered over the valley. The kinds of trees constituting these groves vary with the elevation of the valley; the lower portions are chiefly stocked with Hemlock and Spruces, and young White Pine and a few hardwoods are only seen on comparatively drier ground. The ridge land is covered with scrubby Oaks and other young hardwoods, among which the second-growth White Pine, Pitch Pine and the Pine seedlings are usually scattered. The comparatively high ground only seems to offer more favorable conditions for the natural renewal of the White Pine. The Pine on such portions rarely occurs in pure growth, and is usually mixed with Maple, Beech, a few Yellow Birch, White Birch, Hemlock and Spruce, scattering White Oak, Red Oak and occasional Black Cherry. The White Pine in such groves is imposing, even when found in comparatively small numbers, for with its greater height and well-developed crowns it reaches above all the other sorts of trees and forms a canopy under which they find shelter. The soil is usually protected from the direct rays of the sun by the moderately dense undergrowth, consisting chiefly of young and very small Hemlock intermixed with the hardwoods already named, which are also young and small, under three inches in diameter at breast-height and from five to ten feet high. The soil, being well drained by Bear Creek and a number of other small streams, is kept fresh under the mold layer, which is usually thickly covered with leaves and a few Ferns.

Acre-yield.—The process of regeneration of the White Pine may be fairly illustrated by the following acre-measurements procured from sites representing typical conditions of natural reforestation for the valley. One acre was staked off in a grove on a slope facing south-west. The grove was of hardwoods intermixed with White Pines. The undergrowth consisted of 280 small Hemlock, 146 small Beech, 84 small Maples and 12 small Yellow Birch and White Birch. The loamy sand soil was light, loose, deep, dark brown in color, of medium grain, and with pebbles and gravel intermixed. Of the 216 trees on the acre there were:

80 White Pine,	from	6	to	23	inches	in	diameter	at	breast-height.
68 Maple,	"	14	"	18	"	"	"	"	"
22 Beech,	"	6	"	24	"	"	"	"	"
14 Yellow and White Birch,	"	6	"	24	"	"	"	"	"
12 White and Red Oak,	"	6	"	14	"	"	"	"	"
2 Black Cherry,	"	10	"	14	"	"	"	"	"
18 Hemlock,	"	6	"	14	"	"	"	"	"

The height of the White Pine averaged from 60 to 80 feet; the height of the hardwoods did not exceed 50 feet. The age of the White Pine ranged from sixty to eighty years. The volume of boles of the White Pine equaled 2,918 cubic feet, which means an average annual accretion of 41 cubic feet to the acre. Making an allowance of fifty per cent. for waste when the timber is ready for the axe, 250 feet, board measure, may be counted upon as the annual increment to the acre.

Another acre was staked off in a grove on a slope facing north-east. The grove was of White Pine, intermixed with hardwoods, with scattering Hemlock and Spruce. The undergrowth consisted of 200 small Hemlock, sixty-six small Beech, twenty-four small Maple and ten small Spruce. Soil, sandy loam of a reddish brown color, fine grain, medium loose, fresh, deep, with two to three inches of mold on top and a surface cover of abundant leaves, Laurel and a few Ferns. Of the 232 trees on the acre there were:

154 White Pine,	from	3	to	23½	inches	in	diameter	at	breast-height.
36 Maple,	"	6	"	14	"	"	"	"	"
18 Beech,	"	6	"	14	"	"	"	"	"
16 Hemlock,	"	6	"	10	"	"	"	"	"
8 Spruce,	"	3	"	10	"	"	"	"	"

In height and age the trees on this acre were exactly comparable to those described above. The volume of boles of White Pine equaled 5,036 cubic feet, which gives an average annual accretion of 72 cubic feet, or 432 feet, board measure, when ready for the axe. It should be noticed that the density of crown cover* in both groves was very uneven and did not exceed from 0.5 to 0.7.

Growth.—The growth of the young White Pine shows irregularities in its progressive development. Side by side may be found internodes differing more than two feet in length. It is not unusual to measure consecutive internodes and find one from three to six inches, and the other from two to three feet long. The same is true when the annual rings are examined on the various cross-sections; rings three to five millimeters in width may be encircled by others with a width of one millimeter or less. The crowns of the Pine, though not lacking in development, show also a wide difference in their relative length with regard to the total height of the trees. In short, every individual Pine

* The degree of density is expressed in decimals, taking ten to represent a full cover impenetrable to sun rays.

bears evidence of the irregular and extreme conditions in the various periods of its life. It will not be unexpected, then, to find Pine trees of the same age in the valley differing widely in their dimensions. The average dimensions of trees of various ages given below, and based upon the measurements of fifteen trees, may, however, be taken as an indication of the rate of growth of the White Pine in Bear Creek Valley:

Description.	Age.	Diameter (breast-high).	Height of tree.	Height to base of crown.	Volume. Bole, cu. ft.	Volume. Merchantable timber, b. m.	Remarks.
Young White Pine grove, mixed with mature Spruce, Hemlock and scattering hardwoods.	53	10½	52	19	16	65	Nine trees measured, from 47 to 64 years old.
Hardwoods intermixed with White Pine, Pitch Pine, Hemlock and occasional Spruce.	96	24	82	30	118	557	Four trees measured, from 92 to 98 years old.
Ridgeland densely covered with young hardwoods, among which White Pine and Pitch Pine are scattered.	126	30	87	27	167	791	Two trees measured of 123 and 128 years old.

From this table it is seen that the growth in height is here comparatively slow for the first fifty years, and much slower for the next seventy-five years, while the diameter for those same periods increases very rapidly, especially during the second fifty years. This is exactly what should be expected from Pine growing in half-open or entirely open groves.

Washington, D. C. *A. K. Mlodziansky.*

Foreign Correspondence.

The Royal Horticultural Society.

THE extent, interest and variety of the plants shown at the last fortnightly meeting were such as one expects to see only at a large exhibition. The hall in which the meetings are held is not nearly large enough to accommodate all the plants now sent to these meetings, and the society will be compelled to place some limit on the number of plants sent by each exhibitor or else a larger hall must be found. The latter alternative is most desirable. It would be a pity to place any limit upon the exhibitors, especially as the quality of the exhibits is almost invariably of a high order. Certainly the result of the activity shown by the society during the last few years has been to make these fortnightly meetings both popular and useful. To be able to go to a centre where all the new and interesting plants can be seen growing is a great improvement upon having to get some idea of them from pictures and descriptions in the papers. The importance of these meetings as a help in the promotion of horticultural taste cannot easily be overrated.

Primulas and Auriculas were the special feature of this mid-April meeting, and they were as well represented and admirable as ever. The season has been a little backward for them, still the collections of show, alpine and fancy Auriculas were large and interesting, and it was a positive pleasure to go from group to group noting the charms of green edges, gray edges, white edges; the selfs and golden eyes among the alpines, many of them with the meal and color laid on with such mathematical accuracy as to look artificial. One must inspect these plants in such company as Mr. James Douglas, Mr. Sanders, the Rev. F. D. Horner and Mr. Turner to fully appreciate and understand their points. There is no plant enthusiasm like that of the Auricula fancier. New varieties were awarded prizes and certificates, and altogether there was abundant evidence of the vitality of the Auricula cult. Daffodils were in as strong force as Auriculas, prizes being offered to collections, while in the numerous new hybrids and seedlings shown there was evidence here also that Narcissus has become an established favorite in English gardens, although our friends on the Continent see no beauty in these flowers. The Rev. G. H. Engleheart's collection of new seedlings and hybrids was of the greatest interest, several of them being of quite exceptional merit; one, called Red Prince, after the style of Nelsoni, with a large open cup of rich scarlet, and another named Beacon, of similar character, being considered by some competent judges as two of the most beautiful hybrids yet raised. They were awarded first-class certificates, as also was a new hybrid named Snowdrop, raised from N. albicans and N. triandrus. Mr. Engleheart says his work among the Daffodils is a source of the greatest delight, and one might add that such successes as he achieves ought to be a source of considerable profit also; for it has come to pass that fanciers of these plants will pay five, ten or twenty guineas for a single bulb of a new Daffodil. I should say the two new ones named above are each worth considerably more than the last-named sum. True gardening is, of course, done for love; at the same time the commercial side of the work has an importance which even our wealthiest amateurs nowadays do not overlook.

The Orchids were represented by an exceptionally large number of new and rare kinds, as well as specimens showing good cultivation. The most noteworthy, perhaps, was a hybrid raised by Messrs. Veitch & Sons from Lælia Digbyana and Cattleya Trianæ, which resembles the hybrid raised some years ago by the same firm from this Lælia and Cattleya Mossiæ, but it is darker in color and differs slightly in the form of the segments. It obtained a first-class certificate. Zygopetalum Perrenondi superbum is a larger-flowered and richer-colored variety than the type raised by Messrs. Veitch from Z. Gautieri and Z. intermedium. It was awarded a first-class certificate. Similar distinction was accorded to a very fine variety of Odontoglossum Wilckeanum named Empress-Queen, and shown by Baron Schrœder; it has large full flowers, heavily barred and spotted with red-brown on a bright yellow ground. Two other Odontoglossums obtained certificates, as also did a beautiful example of the old but now rarely seen Dendrobium albo-sanguineum. Large groups of Orchids from Messrs. Veitch, Sander, Low, Williams, Sir Trevor Lawrence, Baron Schrœder, Mr. Lucas and others were remarkable for the numerous beautifully grown examples they contained. Epidendrum bicornutum, as vigorous and well flowered as could be wished; Dendrobium Brymerianum, with thirty clusters of flowers; Cymbidium Devonianum, with four strong flower-spikes; Cattleya citrina, in great number and well flowered; C. Shrœderæ alba, with fourteen beautiful flowers, and Ansellia Africana, with nine large spikes of pale yellow-brown barred flowers. When it is remembered that these plants, which are valuable and delicate, are brought long distances in treacherous weather and exposed to the unfavorable conditions of an ill-constructed hall, and all for love, no prizes of any kind being given, such displays speak much for the generous enthusiasm of the Orchid devotee.

Erythroniums are most useful plants for spring gardening, and some of them are quite worth growing in pots for the conservatory. E. revolutum, with ovate mottled leaves and scapes a foot high, bearing large rose-tinted flowers over two inches across, was awarded a first-class certificate. Ornithogalum lacteum, an old garden plant of last century, but still one of the best of the Cape species, was awarded a certificate under the name of O. grandiflorum. It has strap-shaped leaves a foot long and scapes two feet high, bearing dense racemes of white and yellow flowers,

each about two inches across. A variegated Potato, the leaves heavily and attractively variegated with creamy white, was awarded a certificate; we may therefore now include the Potato among decorative herbaceous plants. In effect it is not unlike a dwarf variegated Elder. Fuchsia Addington, shown by Messrs. H. Cannell & Sons, is a new hybrid between F. fulgens and F. splendens, with large pendent clusters of bright crimson flowers of distinctly decorative character; it was awarded a certificate.

Hippeastrums were exhibited by several specialists, and some of the new seedlings obtained certificates. Growers of these plants find it preferable to raise stock from seeds rather than depend on the same bulbs year after year, and as they mature seeds freely and, moreover, are easily crossed one with the other, one gets novelty and improvement as well as vigor in the seedlings thus obtained. The predominant influence of H. aulicum is a well-marked feature of all the large-flowered seedlings of Hippeastrum in cultivation to-day, while H. equestre and H. reticulatum are very much in evidence among the smaller forms. These plants are now being grown in large numbers in some tropical countries where the conditions are suitable, and the bulbs are sent to England to be sold by auction in the same way as Lilium Harrisii, from Bermuda, is. By the way, I notice that an enterprising planter in Natal has discovered that this Lily may be grown as a field crop there, and he has just sent over four thousand bulbs to be sold in London as an experiment. Yellow-spathed Richardias are, I am told, being farmed in the same way, so that before long we shall be able to buy tubers of these plants at as cheap a rate as Tuberoses. All the so-called new yellow Richardias that we have heard of lately are either R. Elliottiana or R. Pentlandii.

London. *W. Watson.*

New or Little-known Plants.

Sambucus leiosperma.

In our number of April 7th last a figure and short description were printed of the black-fruited Elder of the Rocky Mountains, Sambucus melanocarpa, and on page 175 of this issue appears the figure of the red-fruited Elder of the high Cascade Mountains, which Mr. John B. Leiberg has distinguished from Sambucus racemosa and recently described as Sambucus leiosperma.*

It is a stout shrub with spreading branches six or seven feet high, leaves composed of from five to seven nearly glabrous leaflets varying from oblong to lanceolate, acute or acuminate and sharply serrate, oblong, somewhat flattened cymes of yellowish white flowers and scarlet berries in which are from three to five smooth nutlets.

Sambucus leiosperma is the red-fruited Elder of the high mountains of Oregon and Washington, extending, according to Mr. Leiberg, northward to Alaska. Whether the character, the smoothness of the nutlets, by which it is proposed to distinguish Sambucus leiosperma, will prove constant, we have now no means of judging. The specimens collected near Crater Lake, Oregon, last summer by Mr. Leiberg and Dr. Coville, of the Department of Agriculture, are certainly very distinct, as appears in our figure. The red-fruited Elder, however, on the Oregon and Washington coast region, judging by a single specimen only, has the distinctly pitted nutlets of Sambucus racemosa.

Plant Notes.

Tulipa Greigi aurea.—All lovers of Tulips are familiar with the species introduced some years ago by Regel and named Tulipa Greigi. It is the most handsome and striking of wild Tulips, having light, glaucous spotted leaves, which are very ornamental, and bold flowers with large wavy petals. The form originally introduced was a brilliant salmon-red in color. Although a most desirable plant, T. Greigi is not apt to prove more than a transient visitor in gardens unless cultivated under special conditions, and as, unlike most Tulips, it does not make surplus buds or offsets, we have until lately been dependent on seedlings for increase of stock. These seedlings usually show some variations in color in reds and yellows. Latterly, large numbers of the bulbs have been collected in the Sir Darja region of Turkestan, and it is said that practically there are two types, the red one usually known and the yellow form lately introduced as variety aurea. The latter differs from the older type only in the color of the flowers, which may be feebly described as a singularly deep, glowing yellow, with red markings on the exterior of the petals and red blotches over black eyes on their bases within. We can think of no flower with a richer color than that of one of these Tulips, which was sent to this office last week by Mr. Gerard.

Tulipa Greigi bears every indication of being a vigorous plant, and its failure to become established in gardens is probably only owing to the unnatural conditions under which it is grown. On the steppes in which it occurs no rain falls, it is said, during five months. This indicates, of course, that the bulbs should be kept perfectly dry after flowering, and the simplest plan, evidently, is to lift them as the leaves die down and store them in a hot dry place till late in the year.

Cultural Department.

The Hippeastrums.—II.

SPECIES AND VARIETIES—CONTINUED.

Hippeastrum stylosum, the salmon-colored Amaryllis, from Guiana and the valley of the Amazon, is an interesting species. It bears an umbel of from three to eight flowers of a bright salmon color. Although growing easily in a warm room, it deteriorates rapidly in the moist greenhouse in winter. I received a plant from Mr. Henry Pfister, head gardener of the Executive Mansion, Washington, to whom it had come from the Sandwich Islands under the name of Amaryllis Honoluluensis. Lately I have been informed that this species, together with H. equestre, is common in the gardens of Honolulu. It needs tropical treatment in summer, but in the greenhouse it must be kept in a dry warm place during the winter.

Hippeastrum solandræflorum, the Long-tubed Amaryllis, is another tropical species. It is a native of Venezuela, Guiana, northern Brazil, Colombia, Panama, Costa Rica and the Lesser Antilles. G. F. Appun, in his interesting work, *Unter den Tropen* (vol. i., p. 240), informs us that it is called "Lirio" in Venezuela, and that it grows abundantly on the dry southwestern slope of the coast Andes, where it is a great ornament when the rainy season begins. It flourishes in the open, treeless region among the grass. In cultivation its leaves grow to a height of from twenty-six to thirty inches, and the flower-scape is often more than a yard high, crowned with a magnificent umbel of from four to six long-tubed lily-like very fragrant flowers. The color varies very much, some flowers being milky white, others creamy, and still others almost pure white with red veinings and lines; the interior of the tube is green. In congenial soil and in a tropical climate the bulb grows to a large size, often five to six inches in diameter. Of the variety H. conspicuum I have received bulbs fifteen and sixteen inches in circumference. Through the kindness of Dr. A. Ernst, of Caracas, I came in possession of bulbs of the variety Striatum. The flowers of this form are exceedingly fragrant, and though more brilliant and conspicuous, their long-tubed shape reminds us of the Lilium longiflorum. The color of the blossoms is white, veined with dark crimson. The best of all the varieties is, without doubt, Conspicuum, which was introduced into cultivation in large quantities by Haage & Schmidt, of Erfurt, about fifteen years ago. A good picture of it appeared in Regel's *Gartenflora* (plates 949 and 956). The very symmetrical flowers, of which six to eight are borne on a strong scape, a meter high, are creamy white with a delicate rosy blush, veined and lined with purplish crimson. It grows vigorously in a warm atmosphere and develops its strong scapes of deliciously scented flowers before the leaves appear. None of these plants are easily kept in good health in the greenhouse. They really need stove temperature all the year round. In winter they must be placed in a warm, dry position in the stove, and should never be watered until the flower-scape has attained a height of three or four inches. In Herbert's time H. solandrifolium was used freely in cross-fertilization, but of late it has been

* *Proc. Biological Society of Washington*, xi., 40 (1897).

Fig. 20.—Sambucus leiosperma.—See page 174.

1. Flowering branch, natural size. 2. Fruiting branch, natural size. 3. Vertical section of flower, enlarged. 4. Fruit divided transversely, enlarged. 5. A nutlet, enlarged.

entirely abandoned in this respect. The H. ambiguum, which was sent from Lima, Peru, to the Glasgow Botanic Garden, and described subsequently by Dean Herbert as a new species, has been ascertained to be a cross between this species and H. vittatum.

Hippeastrum reticulatum, the autumn-flowering Amaryllis, I have been unable to obtain. It is said to be indigenous on the shores of Botafoga Bay, near Sao Domingos, Brazil. Its variety Striatifolium is much more abundant and more beautiful than the type. Large specimen plants, consisting of many bulbs, are not rare in collections. The bulbs are small, short-necked, and the leaves, which are of a deep green color, are banded in the centre with a conspicuous creamy white stripe. Although I have had fair success with almost all my Amaryllis, this one I cannot induce to grow or flower, no matter how I treat it. In Missouri, where my plants were kept in a

room near the window, it grew without trouble. Nor can I succeed with the robust hybrids raised from it by Mr. B. S. Williams, of London, such as Mrs. Garfield, Mrs. William Lee, George Firth, Comte de Germiny, etc. My bulbs of the first two hybrids deteriorated, and I finally gave them to Mr. Pfister, who succeeded in the course of a few years in developing magnificent show specimens with them. All these plants flower in autumn, the scapes bearing umbels of from four to five flowers, varying from a bright rosy color to deep scarlet, conspicuously netted with a deeper red. These plants are evergreen, and water should, therefore, never be withheld entirely. A writer in the *Gartenflora* recommends that all these species and hybrids should be placed in the stove when making their growth. "In winter, when at rest, they should not be watered at all, except when the leaves begin to shrivel, and they should be kept in a cool house until they begin to push up their young leaves."

Hippeastrum procerum (Amaryllis Rayneri), the Blue Amaryllis, Lily of the Empress, Imperial Amaryllis and Amaryllis Imperatrice, a singular Brazilian plant, departs widely from all other species of the genus, the bulb being large, stem-like, ovoid. The neck stands high above the ground, while all the bulbs of the other species are more or less deeply buried in the soil in their native haunts. The leaves, which hang down on the sides of the bulb, are bright green, edged narrowly with yellowish brown. They are two or three feet long. The flowers are blue. The species is found near Petropolis, from whence it was introduced to France, and flowered first in 1863. Mr. Lietze, the well-known botanical collector at Rio Janeiro, writes me that it grows on the mountain-sides in rather dry and sunny openings. My bulbs never flowered, and always perished after I had them a few years in cultivation. In *The Garden* (vol. xlv., p. 350) a fine plate was published, and your London correspondent, Mr. W. Watson, gave the following account: "According to Mr. Baker, as many as twelve flowers are produced in a single umbel, each flower being six inches long, but the Kew plants produced five and seven flowers, respectively. . . . The largest specimen has a stem-like neck two feet long, crowned with ten falcate leaves, and is a striking plant even when not in flower. The plant is evergreen under cultivation. . . . Cultivated in a pot it lives and grows slowly, but does not flower. Planted out in good loam, well drained, in a position where it will get plenty of light all the year round and in an intermediate temperature, it appears to be quite at home. I may add that in the same house and under the same treatment Buphane disticha and Brunsvigia Josephinæ have flowered."

Hippeastrum rutilum, the Fiery Amaryllis, or Orange Lily, is a splendid species, and with its many varieties is one of the most valuable of the entire genus, since it grows easily and flowers profusely. It is a native of southern Brazil, where also the other varieties, varying in color from salmon, saffron, bright yellow and pale pink to a bright scarlet and fiery orange, are found. The typical species is a strong-growing plant with bright crimson flowers with a green keel extending half-way up the segments. The variety H. rutilum fulgidum (Amaryllis Brasiliensis), with bright scarlet flowers, is showier. Other beautiful varieties are H. rutilum equestriforme and H. rutilum subbarbatum, with umbels of brilliant orange-colored flowers, borne on scapes often three feet high. H. rutilum crocatum bears smaller saffron-colored flowers, while those of H. rutilum citrinum are bright yellow. H. rutilum acuminatum (H. pulveralentum) is a variety with pale pink flowers. One of the most strikingly colored varieties, Ignescens, with bright orange-scarlet flowers, has lately been introduced in large quantities by Mr. William Bull, of London. I still have most of these varieties, and all do very well, especially Ignescens. They all grow in southern Brazil in the deep black vegetable soil, and Dean Herbert's collector found H. pulveralentum in such soil with a scape three feet high and the leaves as long, and the variety Equestriforme was discovered by Mr. Herbert growing unperceived in a mass of parasitic plants, Cereus and Pitcairnea, which had been torn off from the face of a rock. In the rage for new plants which marks our time, these beautiful Amaryllis have been nearly forgotten, being at present rarely found in cultivation, though they are much more beautiful and valuable than the majority of plants now offered for sale. It is true they do not offer good material for the commercial florist, being slowly increased and flowering only once in the course of a year, but they are capital plants for the private flower cultivator and the amateur. This holds true of all the Hippeastrum species and varieties, and especially of the standard hybrids.

Hippeastrum pardinum, Spotted Amaryllis. This unique species is of comparatively recent introduction, having been discovered in the Andes of Peru by Mr. Pearce in 1866, and sent to Messrs. Veitch & Sons, of Chelsea, where it flowered in 1867. It is so beautiful and so unlike anything else in the line of Amaryllis that it created a genuine sensation. The segments are broad, regular, of a creamy white or yellowish-green ground color, densely spotted and flushed with blood-red. The flowers are very short-tubed and the umbel always consists of two flowers. Not being a very strong grower it needs careful treatment. A number of different colored plates of this plant have been published, but the one that appeared in *The Botanical Magazine* (plate 564 and 565) is a correct representation of the wild species as introduced by Mr. Pearce. A fine form, with exceedingly broad segments of a bright greenish-yellow color, freckled with blood-red, was figured on plate 633 of *Flore des Serres*. Many very beautiful hybrids have been raised from this species, but most of them are difficult to grow. The type does not seem to be in cultivation at present; at least, all my specimens differ more or less from the plate in *The Botanical Magazine*. The exact locality where the first bulbs were collected in Peru is not known.

Hippeastrum Leopoldii, Leopold's Amaryllis, another noble species, was discovered by Mr. Pearce in the Andes of Peru and flowered by the Messrs. Veitch in 1869. It was correctly figured in plate 475 and 476 of *The Floral Magazine*, and all other illustrations are incorrect. This is really a glorious species, but I doubt whether the typical form is found to-day in cultivation, and, as in the case of H. pardinum, we are not acquainted with the locality where Mr. Pearce gathered his bulbs. The plant is of a robust constitution, two scapes being usually produced by one bulb, each carrying an umbel of two flowers. They are very large, widely open, short-tubed, with broad well-formed segments, which are white at the tip, bright red in the middle, with a bifid white keel in the lower half of the red, and a large greenish-white throat. The original bulbs have evidently been lost and their progeny differ in many particulars, though their form is the same. All the bulbs which have flowered with me vary more or less in the red color and lack the bifid white keel in the lower half of the red which makes the type so strikingly beautiful. Collectors in Peru should not overlook these two unique species. Since the introduction of H. Leopoldii a new era in Amaryllis hybridization has begun. All the best modern hybrids are of a robust habit and healthy growth, short-tubed, and show very broad segments. The common hybrids of H. vittatum which we find mostly in cultivation cannot compare in beauty with the kinds which have been obtained by using H. Leopoldii in cross-fertilization. The hybrids coming nearest to this species are John Heal and Hendersonii coccinea, but they are, unfortunately, rather difficult and slow in producing offsets.

Milwaukee, Wis. *H. Nehrling.*

The Hardy Plant Border.

AMONG early spring-flowering alpine plants there is no more interesting genus than that of Draba. At this time, in the rock garden, there are several species in bloom, and although the flowers are small, the compact dwarf habit of the plants, which cling so closely to the ground in the pockets made among the rocks, makes them most interesting to lovers of modest plants. They are easily raised from seed sown in spring, and when they are large enough they may be planted out in the nursery for raising or testing hardy herbaceous plants early in May, and by the end of summer they make good-sized plants for transplanting to their permanent places in the rock garden. A good time to transplant them is about the end of August, so as they will be established in their new quarters before severe weather sets in. They grow best in a dry sunny position, and care ought to be taken that they are not planted where water will lodge around them in winter. Although they love a dry sunny place, yet they like a deep moist soil for their roots to penetrate. Last fall, when transplanting from the nursery beds a number of species of this genus, I was interested to know how deep some of their roots pierced the soil. By careful digging I found that they went down twelve and fifteen inches, although sometimes the part of the plant above ground was not more than one inch in height. This shows that they ought not to be planted in shallow pockets in the rock garden, but in places where their roots can get deep down into the earth away from the hot dry soil on the surface of the ground.

Draba brumæfolia is a lovely tufted dwarf plant with small linear ciliated acute leaves, and it bears pretty, small yellow flowers which are produced slightly above the foliage. This dwarf plant has been grown here for a number of years and is perfectly hardy. D. borealis grows close to the ground and

makes a nice green carpet, and its flower-stems are produced about four inches above the foliage. The color of the flowers is white. D. stellata also makes a good green carpet on the ground, but its flower-stems are six inches high, and has fairly good-sized white flowers. Other species in bloom now are D. rupestris, D. hirta, D. lactea, D. confusa and D. arabisans.

Near relatives of the Drabas are the Aubrietias, which clothe the ground thickly with their evergreen stems, and at this time they have a fine show of blue flowers. In a dry sunny position and partially rich soil they grow freely and are welcome additions to our garden at this season. The Scurvy-grass, Cochlearia angelica, is a dwarf British plant with white flowers, which are borne freely now. It grows and flowers well in a shady position. It is about six inches high and its stems are clothed with ovate leaves.

Viola Munbyana is one of the earliest of the hardy Violets to bloom here. It has flowers nearly as large as those of V. cornuta and of a deep purple-blue color. It has proved quite hardy here for two years, growing freely in a shady position and producing flowers in profusion. Another Violet in bloom, with pretty but small light purple flowers, is V. sylvatica, var. Reichenbachiana. The variety cucullata of V. palmata and its white form are also in bloom, and when they are grown in masses they are very effective, as their flowers are borne in such lavish profusion.

The first of the Leguminous plants to blossom is Orobus Vernus. This excellent, hardy, early-flowering plant, when the frost is out of the ground, grows so quickly that one is always surprised to see it in bloom so soon after it begins to grow. From its black roots rise healthy green leaves, and in a brief time they are almost hidden from view by blossoms of purple and blue. The flowers have red veins, and the keels are tinted with green and then change to blue. The plant is very easy to grow and it is quite happy either in the sun or when slightly shaded, and it enjoys a light rich soil.

In one of the borders some fine tufts of the lovely Anemone Pulsatilla, the Pasque flower, are producing their violet sub-erect flowers. The flowers are about the same size as those of Adonis vernalis, and are made up of six spreading silky sepals. The plant grows six inches high and its leaves are pinnate, and the segments many-parted. This lovely Anemone ought to be more common in gardens. It is quite happy here in a slightly shaded border and in rather stiff loamy soil. Large clumps of Adonis vernalis are grown along the front of the herbaceous border, and their big bright blossoms have been enjoyed for several weeks. When the plants are once established it is better not to disturb them too often. If there is occasion to remove them, this should be done with care and as much soil as possible should be taken with the roots.

The large, stately Crown Imperials are in full bloom now, and they are the tallest plants in the border at this time. Fritillaria Meleagris is also in bloom, and its drooping, curiously colored flowers are very interesting. Masses of the common Grape Hyacinth and its white variety are conspicuous in the front row, making a bright show of blue and white. They not only thrive in this climate, but they multiply in a sunny position and in a light, sandy soil. Arabis albida, one of the easiest plants to grow, never fails to give an abundant crop of white flowers. The Erythroniums are blossoming freely now, a large bed-planting of E. albidum being covered with white flowers. E. grandiflorum, a rarer plant with yellowish flowers produced singly or two or three flowers in a small raceme, is past its best. Another rare variety now in bloom is E. dens-canis, var. Sibiricum. It has flowers of a light chocolate color.

Harvard Botanic Garden, Cambridge, Mass. *R. Cameron.*

Summer Pruning the Raspberry.

IN the spring of 1892 an experiment was started at the Wisconsin Agricultural Experiment Station to determine the effects of summer pruning upon the growth and fruiting of the Raspberry-plant. This experiment was continued through the season of 1895, but as a portion of the plants, in the mean time, were attacked by the disease known as curl-leaf, the results were not regarded as sufficiently conclusive for publication, and the work is to be repeated.

A few points were, however, clearly brought out in this experiment, one of which is the evidence that summer pruning tends to increase the number of canes, both in the Red and Black Raspberry. When the plants in the differently pruned rows were dug out in the spring of 1896 the crowns were noticeably different in the number of stumps whence canes had been cut off in the annual removal of the dead fruiting branches, and in the thinning out of the young canes to a definite number. The stumps were more numerous in the pruned rows. In one series the canes had been pinched twice each season—that is, the primary shoot was pinched at the height of twelve to eighteen inches, and the lateral shoots that appeared later were pinched about twelve inches from the main stem. In these twice-pinched plants the increase in the number of stumps was marked. In the once-pinched plants the difference was manifest, but to a less degree.

The structure of the stem in the Raspberry and several allied plants is peculiar in the fact that the stems, while living over winter, die back each year after fruiting, nearly or quite to the crown, while new branches grow out each spring from the crown at the base of the stems of the preceding year, or very often from these stems, slightly above their juncture with the crown. In healthy plants the base of the dead cane is sloughed off from the living portion, which heals beneath the juncture. Since the young shoots have the nature of branches, either from the old stem or from the crown at its base, we might expect that pinching the tips of the growing shoots would stimulate the growth of new canes, as we know it stimulates branching of the canes above ground.

Since the number of young canes in cultivated plantations of the Raspberry is usually too large to permit the best development of the fruit, unless they are thinned out, it would seem that the wisdom of summer pruning may be questioned. In our experiment there was no positive evidence that the yield of fruit was increased in any case by summer pruning, while it was very clear that it was decreased by the twice-pinching process mentioned above.

The formation of gall-like excrescences on roots has been ascribed to excessive pruning. In this experiment the pruning appeared to have no direct influence upon the number or the size of the root excrescences, a few of which were found on the roots of certain plants in all of the rows.

University of Wisconsin. *E. S. Goff.*

Plum-trees for Ornamental Plantings.

ALMOST any well-grown Plum-tree is ornamental, though those of American species are usually more so than the Japanese Plums, and much more so than the European Plums. I remember to have seen attention called to the desirable qualities of Prunus Americana in GARDEN AND FOREST, but P. angustifolia, P. Watsoni, P. maritima and several members of the Hortulana group have quite as much to recommend them. Prunus angustifolia is a more graceful plant than P. Americana and bears foliage of a fresher green, while P. Watsoni makes a good showing in thick shrubbery borders. A Plum-tree in full blossom is one of the most charming touches in the spring landscape. I was especially struck by the beauty of these trees this spring during a visit to the Plum orchards of the Maryland peninsula. There the white drifts of Plum blossoms interspersed among the pink of the blooming Peach orchards introduce an element of almost dazzling beauty into the rural landscape. Plum-trees there are very commonly planted in farmyards near the dwelling-houses, where they certainly give a better effect than many of the sorry exotics left by the tree agent. Many of the views which one gets in eastern Maryland in Plum-blooming time suggest the paintings of Mr. Alfred Parsons, and give one a real appreciation of the Japanese love for Plum blossoms. The Japanese Plums, by the way, are especially beautiful in blossom, but are not so attractive in habit of growth. [The popular garden tree in Japan is Prunus Mume, an Apricot rather than a Plum, and probably not a native of Japan, but of Corea.—ED.]

But while American Plums are all to be rated together as useful for ornamental planting, there are wide differences among the members of any group. This can be quickly marked among cultivated varieties. Of Americanas, Cheney, belonging to the Nigra section, is remarkably beautiful at blooming-time. Its blossoms are very large and abundant and have a beautiful rose-pink tinge approaching the characteristic tint of Peach blossoms. Cheney also remains in blossom longer than most varieties. In the Hortulana group Sucker State might be noted for special beauty at flowering-time. Moreman and all the varieties of its class, including Wayland, Golden Beauty, Reed, Leptune and Garfield, are not only magnificent in blossom but have a graceful, slender, drooping habit of growth which would mark them out for ornamental planting. Mr. Kerr's Sophie is a tree of the same form and bears an abundance of blossoms, which show a pretty and peculiar pink in the opening buds.

There are varieties of Prunus Americana with nicely doubled flowers if one must have something of that sort.

Seedlings of Prunus angustifolia and P. Watsoni are apt to sprout from the roots. This, of course, is objectionable, but if one selects named varieties for planting, as he should, they may be worked on stocks which do not sprout. Black knot is a drawback to the use of Plum-trees under some circumstances, but in most cases it can be so easily controlled that it ought not to prejudice planters against our beautiful but neglected Plum-trees.

University of Vermont. *F. A. Waugh.*

Work of the Season.

SUMMER bedding plants will claim attention during the next month or six weeks, and the frequent and extreme changes in weather usual at this season call for judgment in setting out tender plants. In the latitude of New York and Philadelphia May 15th is early enough, and farther north this planting out should be delayed until somewhat later.

Among the earliest plants to be put out are young Carnations and Violets for next winter's supply of flowers; these in most instances have been prepared for the change by growing in a cold frame for a few weeks. Carnations and Violets require well-enriched soil and deep cultivation, though for field culture it is probably the safest plan only to use barnyard manure of good quality as a fertilizer. This should be worked into the ground during the previous fall. A plan successfully followed by many large growers is to plant on new ground each season, or, at least, to avoid planting on the same ground two consecutive seasons. Besides the ordinary advantages gained by rotation, the plants are less likely to contract disease from germs which are carried over in the soil and litter.

The hardier bedding plants—for example, Verbenas, Feverfew, Phlox Drummondii and others—are also in the best condition for sturdy growth if kept for some time in a cold frame. They are then in readiness to follow the early spring flowers, as Narcissi, Tulips and other bulbous flowering plants, Pansies and English Daisies.

Tender plants, such as Crotons, Acalyphas, Sanchezias, Coleus, Iresines and Alternantheras, can be handled to better advantage in the greenhouse as yet, and in any event should not be planted out until the ground has become quite warm. If checked by a chill it takes some time for these plants to recover. Cannas are also quite sensitive to cold, and make little headway if planted out too early; from May 10th to May 20th is early enough to set these plants in the open ground. Cannas require abundant manuring and watering. The multitude of new varieties of Cannas seems to crowd out some of the old favorites, such as C. Ehmanii, a noble species for large beds, and the flowers of which are not only large, but are the nearest approach to pink that we yet have among Cannas. This species is also well adapted for conservatory decoration, and flourishes better when kept growing all the year than when it is dried off during winter.

Old plants of Bouvardia which have flowered during the past winter, if planted out in the garden, will give a large quantity of flowers during the summer and prove useful for cutting. Plants of this character are more floriferous than young plants of the present season.

Begonias of the semperflorens type are among available bedding stock, and in some localities prove very satisfactory. They require an abundance of water during dry weather, as do all Begonias grown under these conditions. It is desirable to harden off Begonias in a cold frame previous to planting out, and plenty of light will insure a stocky growth.

A group of miscellaneous flowering and foliage plants can be made an attractive feature of the garden, and will also help to relieve the crowded condition of the conservatory. Among plants well suited for such use are the varieties of Hibiscus sinensis, Abutilons in variety, Grevillea robusta, Phormiums, Ficus, double Pomegranate, Oleanders and Aralias. All of these are admirable, but require a little care in grouping to avoid clashes of coloring.

In making flower-beds it is necessary in our climate to have the surface of the bed level or even depressed slightly in the centre for all moisture-loving plants. It is practically impossible to thoroughly water a bed that is mounded up in the way often practiced by amateur gardeners.

In the greenhouse the work is also likely to crowd at this season. Among the plants apt to need prompt attention are the young Roses in preparation for flowering next winter. It does not pay to neglect these and to allow them to become stunted, and they should therefore be shifted from two to three inch, or from three to four inch pots sufficiently early to avoid any check to their growth, for it may be two months before they can be planted out in the house.

Holmesburg, Pa. *W. H. Taplin.*

Xerophyllum.—This beautiful plant is found in southern New Jersey and southward, and is in full flower early in June. Last year, while botanizing with Mrs. Treat, we suddenly came upon an acre or more of these plants growing stately and tall, with large racemes of crowded showy white flowers. These are borne on a simple and rather stout stem, from two to four feet high, which rises from a thick bulb-like base. The stem is thickly beset at the bottom with very long needle-shaped, rigid, recurving leaves, while above these are shorter leaves which at the top are reduced to bristle-like bracts. The name in Greek means arid leaves. The plant bears transplanting remarkably well. It is established in Mrs. Treat's garden, and flowers as freely as when growing wild.

Vineland, N. J. *M. Abbott.*

Canna, America.—We have just had this Canna in flower, the third in Dammann's list of so-called "Orchid-flowering" Cannas. It has been something of a surprise to us, for in some way we had formed the notion that it was inferior to Italia and Austria. In our present opinion, however, it ranks above both. The foliage seems to be stronger and tougher, and is of a color much harder to get in Cannas. It is dark bronzy-red, with irregular and inconspicuous dashes of lighter greenish color. The flowering-stem is tall and strong, bearing a large spike of flowers of the form and size of Italia. They are, however, of a most rare and striking color, a sort of brilliant apricot-red faintly spotted with darker salmon. The centre is canary-yellow, marked with the apricot-red of the body color, very much after the pattern of Austria and Burbank, except that in America the centre is lighter-colored than the wings. The blossoms are richer in appearance than any of the earlier Orchid-flowering Cannas. They do not appear to be better in substance, though; and this seems likely to prevent the general use of all the Canna flacida crosses in outdoor bedding. If it were not for this flabby quality of their blossoms they would soon very largely supersede the French dwarf Cannas for all classes of ornamental work.

University of Vermont. *F. A. Waugh.*

Correspondence.

The Red Cedar.

To the Editor of Garden and Forest:

Sir,—I remember well how I admired the spire-topped Red Cedars as they grew on the banks of the Hudson River between Albany and New York very many years ago. I came to Waukegan, Illinois, fifty-three years ago. The bluffs on the Lake shore were nearly covered with these trees and Arbor Vitæ, and the former were abundant on the banks of the inland lakes in Lake County. The large trees were cut down for posts by the few settlers as they bought their lands or preëmpted them. Although these Red Cedars are not of as good form as those on the Hudson, nor as those in Florida, I had hundreds of the young trees gathered and made belts and hedges of them. I set an example to my neighbors and Red Cedars were planted by thousands.

I did not build my dwelling-house in the nursery until 1851, and as it was exposed to the west winds I planted a circular belt of White Pines on the west and north sides, leaving ample room between the house and the belt. I planted an Arbor Vitæ hedge running west from the south-west corner of the house, and in 1853 I built a large frost-proof building west of the Arbor Vitæ hedge or belt. From the east end of the Arbor Vitæ hedge I planted a Red Cedar hedge, curving to the west as it ran southward. I had no trouble with the other belts; they stand there to-day, every tree living and answering the purpose for which they were planted. The Red Cedar hedge was a failure after eight years' growth, although I tried every way to make it a success. My other Red Cedar belts were abject failures, too.

Two nurserymen, each bought a forty-acre lot and carried on the nursery business here. They have both been dead for many years, and on each lot there is a neglected mass of trees taking care of themselves. On both there are the remains of a Red Cedar belt that has stood for over forty years, and here and there a tree remains alone, but not one to the rod has heart-wood enough for a common fence post. The old Red Cedar trees that made such excellent posts must have been very old, as the trees I have planted stood many years before forming heart-wood, and in using a lot of them for poles I found that the White Pine and Silver Maple poles of the same size endured longer than the Red Cedar poles.

Waukegan is as thickly planted with evergreens as any city I ever saw of its size. Thirty-five years ago a large majority

of these evergreens were Red Cedar. Now I cannot think of but one Red Cedar growing as an ornamental tree, and this is about six feet high.

Waukegan, Ills. *Robert Douglas.*

Maple Sugar in Vermont.

To the Editor of GARDEN AND FOREST:

Sir,—Vermont makes considerably more maple sugar and syrup than any other state in the Union. The average sugar crop is about 15,000,000 pounds, besides syrup. The season just closed has been exceptionally favorable, and this, in conjunction with a marked revival of interest in sugar-making, has carried the figures for 1897 much above the average; how much cannot yet be told. Sugar-makers began tapping from March 24th to April 1st, according to locality. A few days of backward weather marked the early part of the season in northern towns, but everywhere a very heavy run was experienced, which lasted ten days or two weeks. The amount of sugar made from each tree seems to have been unusually large. Some sugar men report an average of from three to four pounds, or even more, from large orchards, but the average through the state is not so high.

The quality of the product is improved every year. This is the result of the improvement in methods of manufacture, which have been notable in recent years. This is also evidence of reviving interest among owners of sugar-trees. There are still a good many large sugar orchards in Vermont which are not worked, but their number decreases.

Prices this year have not been entirely satisfactory. The weakness of the market was partly due, perhaps, to the large crop harvested, but there is a general feeling that there was a still greater increase in the sales of adulterated articles, to the prejudice of pure sugar and syrup. Prices for sugar have varied greatly. Some fancy lots sold in retail markets early in the season as high as twenty cents a pound. Prices for large quantities ranged from five to eight cents, the wholesale price keeping pretty close to five cents. The buying price for syrup in Burlington has ranged from fifty to fifty-five cents, with the retail price anywhere from sixty to ninety cents. It is probable that, with the increased output of maple sugar and syrup, there will be more of both used in the state, and it may be hoped that the lower prices will enable people elsewhere, who do not usually have that pleasure, to enjoy for once some pure maple sweets.

University of Vermont. *F. A. Waugh.*

Scymnus marginicollis.

To the Editor of GARDEN AND FOREST:

Sir,—Professor J. B. Smith, in his report on the enemies of the San José scale, just issued, describes the introduction of the beetle Scymnus marginicollis into New Jersey, but questions whether it will live so far north. It may be worth while to state that it occurs in New Mexico at Santa Fé, in the Transition Zone (collected by myself, determined by Mr. H. F. Wickham), so there is apparently no reason why it should not survive in New Jersey. It also occurs in the Upper Sonoran Zone, having been found by Mr. Wickham at Albuquerque. In Arizona Mr. Wickham found it at Seligman and Williams, the latter place having an altitude of 6,727 feet—only a few hundred feet lower than Santa Fé. In the same report Professor Smith refers to the fact that we do not know the original home of the San José scale. It may suffice now to state that from evidence lately obtained, which I shall set forth fully on another occasion, I am satisfied that it is a Japanese insect.

Mesilla, N. M. *T. D. A. Cockerell.*

Recent Publications.

Lawns and Gardens. By N. Jönsson Rose. With Plans and Illustrations by the Author. G. P. Putnam's Sons. New York. 1897.

Mr. Rose is a practical gardener and he has prepared a treatise which will prove of genuine value to the large and increasing number of those who take a personal interest in their home grounds. It does not aim above the intelligence or æsthetic sense of the ordinary American citizen who has never given any thought to planting and to whom some of the profounder principles of garden-art make no convincing appeal. Beyond the field this book covers there lies a region where a more subtle art holds sway—an art whose examples can be analyzed, but an art which never can be taught. Essays on ideal gardens and the philosophy of garden-art are lost upon the man of average taste who wants something tangible, something which he can understand and appreciate, something which he can take home and apply to the planting of his city lot or the grounds about his suburban residence. Mr. Rose has planned to give instruction on this level and he has carried out his project with consistent interest in a book of four hundred pages and nearly two hundred illustrations, which are invariably helpful, although many of them are lacking in refinement and show no great merit as works of art. After a chapter on the study of natural scenery the instructions begin at the bottom by explaining the use of the instruments used in surveying and leveling. Directions for planning grounds, especially those of moderate size, are given in the form of a few examples which can be easily understood, and the methods of grading and modeling the surface are illustrated. Then follow suggestions as to the grouping and massing of trees and shrubs, with notes on the placing of specimen plants and detached groups, directions for constructing flower-beds and borders, and such details as are ordinarily entrusted to a skilled head-gardener. The last part of the book, like other works of its class, is taken up with a description of the best trees, shrubs, herbaceous plants and climbers for use in various situations in our climate.

Of course, a handbook like this is not meant to take the place of a professional landscape-gardener. Indeed, the sphere of an artist of high creative faculty is entirely outside of the regulation practice here laid down, but, unfortunately, artists of the first rank in landscape-work are rare, and when a so-called landscape-gardener is employed the chances are that his studies will be devoted to the solution of the more obvious questions of detail which are treated in this work. One who recalls the country places with which he is familiar and makes a note of all those which have been treated in anything like a satisfactory manner, will be surprised to note how few they are. Any book, therefore, which gives in a plain way practical directions for treating grounds so as to make them convenient and for producing effects that will be pleasing and not wearisome, ought to be welcome, and we have no doubt that this beautifully printed book will prove helpful to many beginners who propose with some seriousness of purpose to study the garden possibilities which lie about their houses.

Notes.

A box of Purple Guigne cherries, from Vacaville, said to be the first to leave California this season, reached New York on Monday, consigned to Messrs. Joseph Hahn & Sons.

In a recent number of *The Journal of Commerce*, of this city, it is stated that a law has been enacted in Bolivia granting concessions in the rubber-producing districts to foreigners as well as natives. The trees which yield this material grow wild on immense tracts of government land in eastern Bolivia, and the industry has heretofore been developed in only a small part of this territory. Much of the rubber now in commerce comes from Brazil, where its production and exportation are restricted by law to citizens of that country.

Asparagus is now fully in season and is coming from Maryland, Delaware and New Jersey, besides the southern Atlantic states. The crop of Bermuda onions is said to be short this season, and besides 30,000 crates which arrived here last week only one or two large shipments are yet expected. New onions are now coming from New Orleans by the carload, but these are neither properly cured nor well packed. The season for onions from Egypt will begin in two or three weeks. New Florida potatoes are now quite plentiful. Crookneck squashes have been in market for the past fortnight and sell at the rate of three for twenty-five cents. Tiny young okra sells at $1.00 a hundred. Small heads of cauliflower grown under glass on Long Island cost forty to fifty cents each. String beans, from Georgia, are succeeding the Florida crop, and peas come from North and South Carolina.

The abundant crop of fruits in this country last year is still indicated in the trade in dried fruits. Sun-dried and evapo-

rated apples are in demand, notwithstanding the continued supply of fresh apples, and last week the available stock of evaporated apples not held back in cold storage in this city was not sufficient to supply the home and export trade, and prices for the grade rated as prime advanced a quarter cent a pound. During the corresponding term last year 139,888 cases of evaporated apples were sold in New York, and in the present season 415,580 cases, or nearly three times the quantity. Dried small fruits are nearly all closed out, excepting raspberries, but California peaches, apricots and prunes still sell readily at fair prices. The exports of all kinds of evaporated and dried fruits from this port since September 1st amount to 654,053 packages.

Strawberries became more plentiful during last week, and besides the last of the crop from South Carolina, crates and refrigerators of this fruit were forwarded by freight and express from North Carolina and Virginia. On Saturday firm, well-ripened berries of good size and flavor sold for twenty-five cents a quart box. In some of the fancy-fruit stores hothouse strawberries are still on sale, and no more perfect and beautiful specimens of this fruit have ever been seen here. Cups which hold a third of a quart sell for $1.50. Maple sugar is offered in the fancy-fruit stores in two-pound bricks, the darker product here costing twenty-five cents and the more highly clarified, thirty cents. Almeria grapes, carried over in cold storage, and useful in making up fruit-baskets for travelers, sell for fifty cents a pound. The grape-fruit now offered comes from California and costs from ten to twenty-five cents each. Navel oranges, from the same state, sell for sixty cents, and the fancy King of Siam oranges for $1.50 a dozen.

A law was enacted at the last session of the Massachusetts Legislature authorizing townships to elect wardens who shall have full care and control of the public shade trees of the town. This officer is to supervise the setting out of trees and their removal, if in his judgment it is for the best interest of the public that any should be removed, and he enters and prosecutes complaints for injuries to public shade trees. Under this act, Mr. James Lawrence has been elected tree warden of Groton, and we have received a copy of a handbill which he has ordered to be posted on all schoolhouses and other public places throughout the township. This notice contains the law under which the warden was elected and enumerates his powers and duties; it contains also a summary of the statutes of the state which prohibit the cutting down or injury of trees along the streets or public roads of the town. These laws are good ones, and if they are only enforced as they should be the street trees of the town will be reasonably safe. The example of Groton and its tree warden is to be commended to the other towns of Massachusetts.

In the winter palace at St. Petersburg is the Nicholas Salon, which is decorated with seventy-two Palms, averaging from twenty-five to thirty feet high. These stand in six rows of twelve plants each, and around each plant-tub is constructed a table at which ten persons can be comfortably seated at dinner. The Palms stand so far apart that their spreading tops do not touch, and the outline of each can be seen to advantage. The skill of the court gardener is shown in the fact that these tubs are only thirty inches in diameter, and they cannot be enlarged, owing to the limited size of the table. As the Palms remain in the palace from January until May, they lose seven or eight leaves every year which must be replaced by as many new ones before the following January. To bring about this growth the plants are turned out of the tubs as soon as they are taken from the palace, the roots are severely shortened with an axe, and the ball is re-tubbed in turfy loam, fertilized with bone-meal, and the Palms are then placed on a warm bed in the Palm-house. Here they remain until their new leaves are developed, and at New Year's they are transported to the palace, well packed in thick coverlets as they are carried through a temperature which sometimes falls to forty degrees below zero.

Among low trailing shrubs suitable for the rock garden there is none more beautiful than the alpine Daphne Cneorum, which is found on the calcareous soil in the Jura and southern Alps as well as in Hungary and Transylvania. In its home it is often called the Pearl of the Mountains, and its close clusters of delicately scented rose-colored flowers are now at their best. It is an old plant in gardens, and we call attention to it every year, but its beauty cannot be too highly praised. The roots are fine and thread-like, which shows that they like to wander in deep light soil. The plant is evergreen, and it often burns in the winter. It will not endure thick covering, however, but a light sprinkling of straw, which allows a circulation of air, is highly beneficial. In our mention of this plant in spring we never can refrain from associating with it the hardy Candytufts, which are also trailing sub-shrubs. These are perfectly hardy, and when once established they will endure for many years, and, although the new growth may be killed back in winter, they always start early in spring, and at the extremity of each branch they bear a cluster of dazzling white flowers. The two plants, owing to the marked contrast in the color of their flowers, always look well together, and just now they are both unusually full of bloom.

In some notes on Breeding Tomatoes, contained in a recent bulletin issued by the New Hampshire Agricultural College, the point is made that the Tomato plant is quickly susceptible to careful selection, and that in selecting seed the plant, as a whole, has a stronger hereditary influence than the character of the individual fruit—that is, nothing can be gained in earliness, for example, by selecting seeds from the first ripe fruits, regardless of the general character of the plant from which they come. The same rule holds in regard to the production of new varieties by crossing, so that the more uniform and persistent the parent plants the greater is the chance that their characteristics will be transmitted. When once a desirable variety is obtained it can be kept only by constant selection. Varieties, as a rule, have been short-lived, chiefly because no care has been taken in selecting seed. Poor soils and insufficient cultivation tend to cause a variety to revert. Hybridizing between the large varieties and the clustered or currant-fruited kinds usually results in fruit intermediate in size, and crosses between the potato-leaved varieties and the common-leaved varieties usually result in intermediate foliage. As varieties mix readily when grown in the same field, pure seed can only be assured by selecting from isolated varieties. Rotation is a necessity, and plants grown on the same land from year to year, although highly fertilized, will degenerate in time. Haphazard crossing is of little value, and in order to attain any proposed ideal one must be particularly acquainted with the parent sorts and have clearly defined plans of procedure. When the parents are of a very different character the offspring is likely to be weak, while a cross between closely related species or races is likely to be vigorous. One characteristic of great importance in the Tomato has been too general neglect in producing new strains, and that is the keeping quality which varies widely among different varieties. Experiments at the Cornell Station seem to show that the solid varieties may not be the best keepers.

Like many of the preceding bulletins relating to vegetables, which have been issued by the Rhode Island Experiment Station, the one just issued on Celery is an admirable little tract which will give delight to every cultivator of this plant. No known substitute can take the place of Celery among vegetables, and no cooking or other process can make the blanched and tender stalks more delightful than they are when they leave the skilled grower's hands. Celery needs abundant water, rich soil, and, as the experiments at Kingston seem to show conclusively, it needs especially cool soil about the roots. This may be one reason why the old trench system has never been superseded, for under it the roots are shaded, and when they are properly cooled the diseases known as black heart and blight have no terrors. Seaweed, when spread two inches thick about the plants, is found to be an excellent mulch both for the preservation of water and the cooling of the soil. There is an excellent account of varieties, old and new, and Giant Pascal is said to be, like the Marshall Strawberry, too good for market purposes. The first American booklet on Celery-culture seems to have been written by M. Rœssle, landlord of the Delavan Hotel, in Albany. It was Peter Henderson who first advocated, between 1850-60, the change from the trench system to the surface-growing plan, and the development of Celery-culture as a branch of industry has been due more to his writings than to those of any other one person. After the simplification of Celery-culture by growing the plants on the surface the next great advance appeared between 1885-90 in the use of boards instead of earth for blanching, a practice which followed close upon the introduction of the self-blanching varieties. The White Plume is a seedling from an American sport which was introduced in 1884. Paris Golden originated in the garden of Monsieur Chemin, near Paris, at about the same time. In what is known as the new culture, Celery-plants are set from eight to twelve inches apart each way in beds, and when skillfully managed under high cultivation very large yields are secured. Three or four times as many plants are grown to the acre as under the ordinary system, but if the beds are neglected even for a few hours great loss is certain.